

FIG. 1

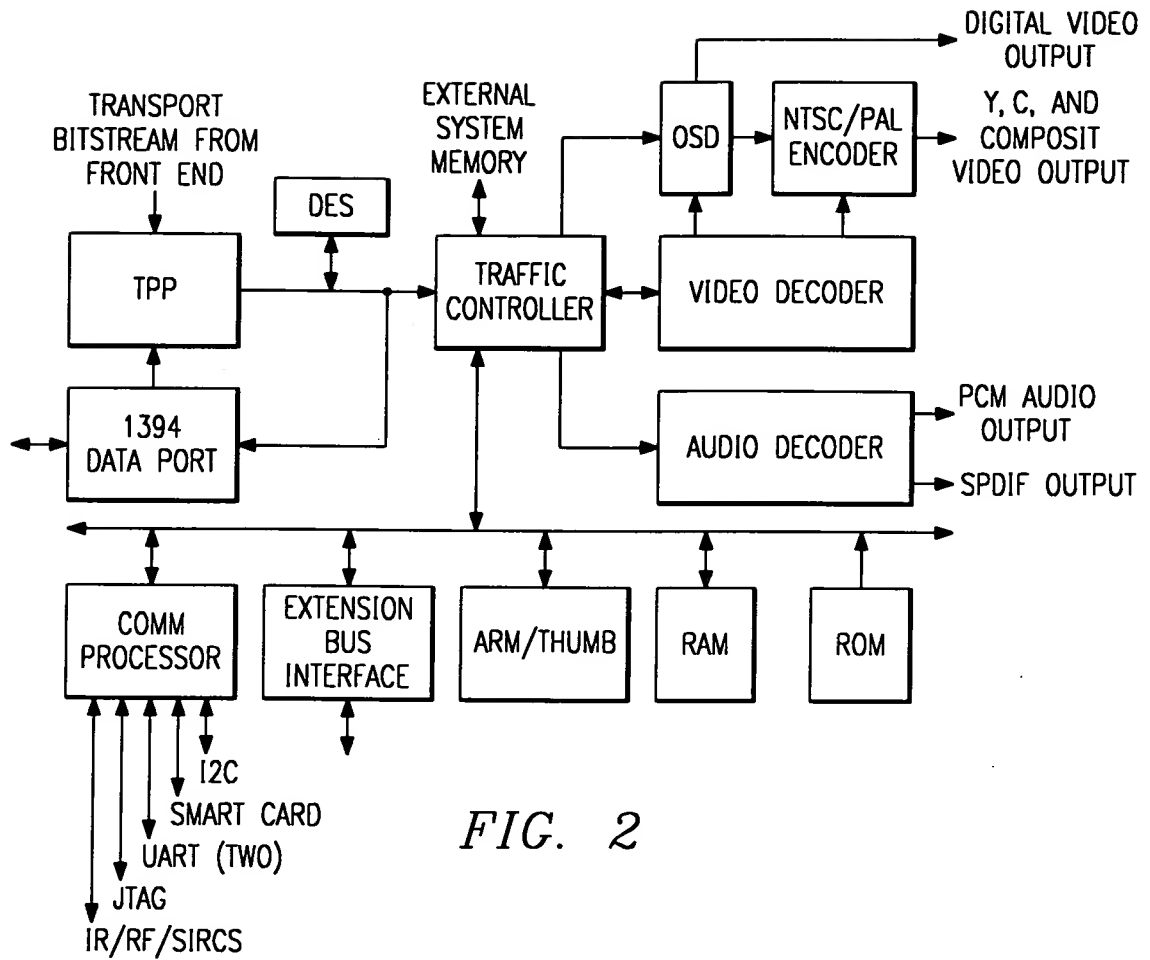


FIG. 2

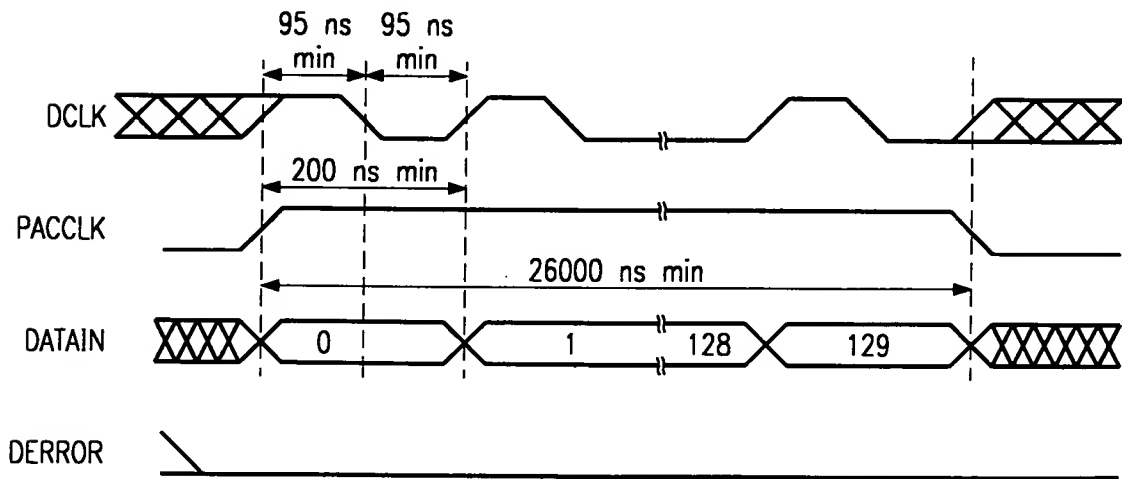


FIG. 3

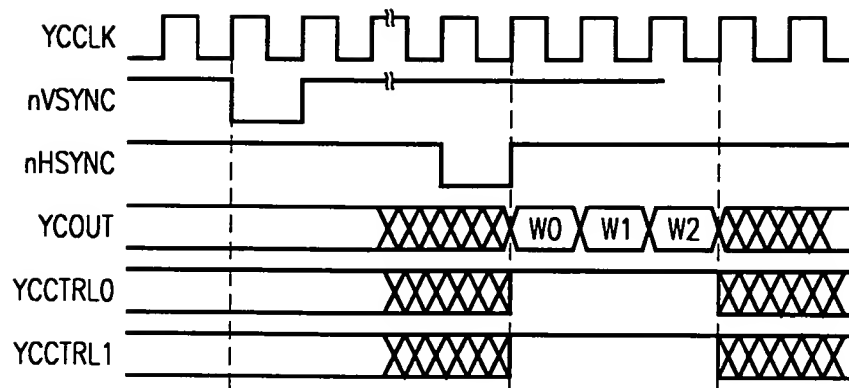


FIG. 4

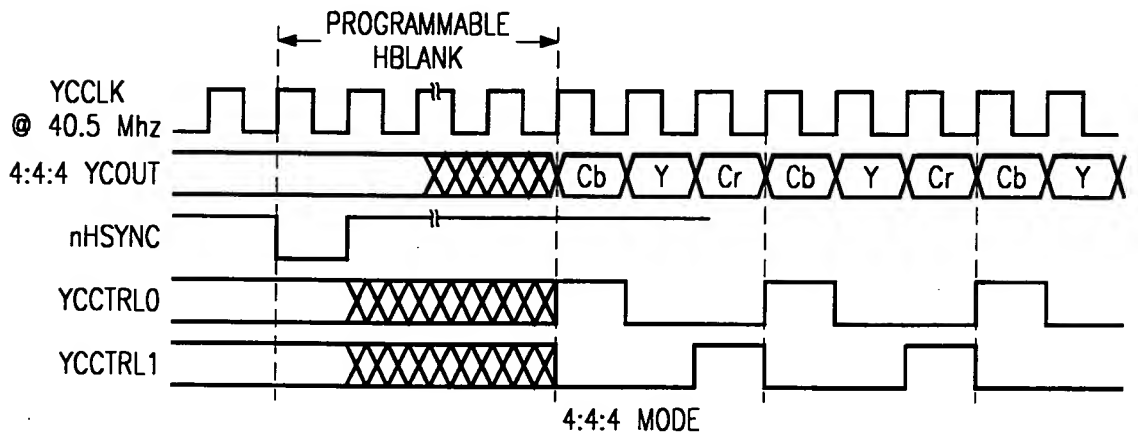
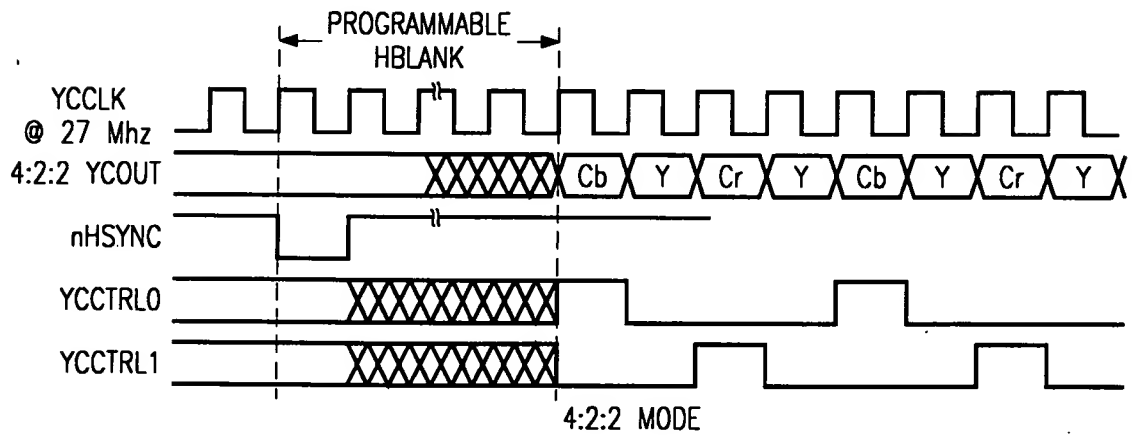


FIG. 5

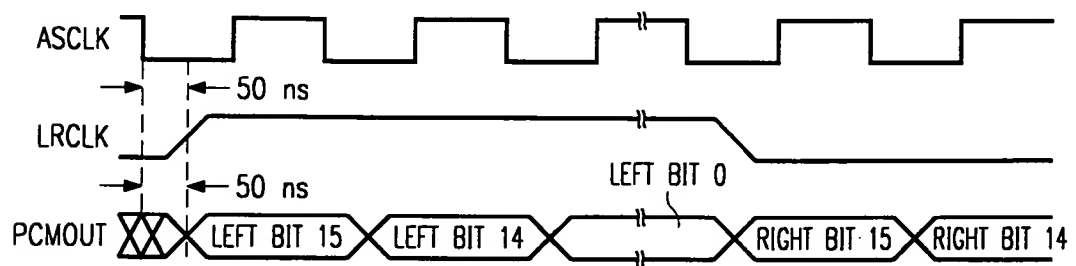


FIG. 6

FIG. 7

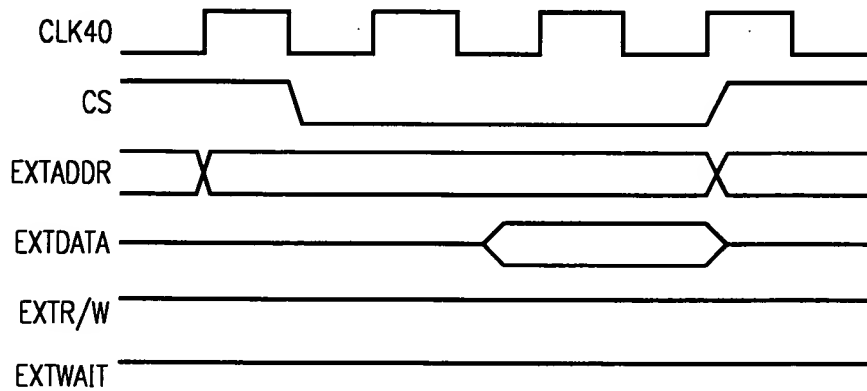
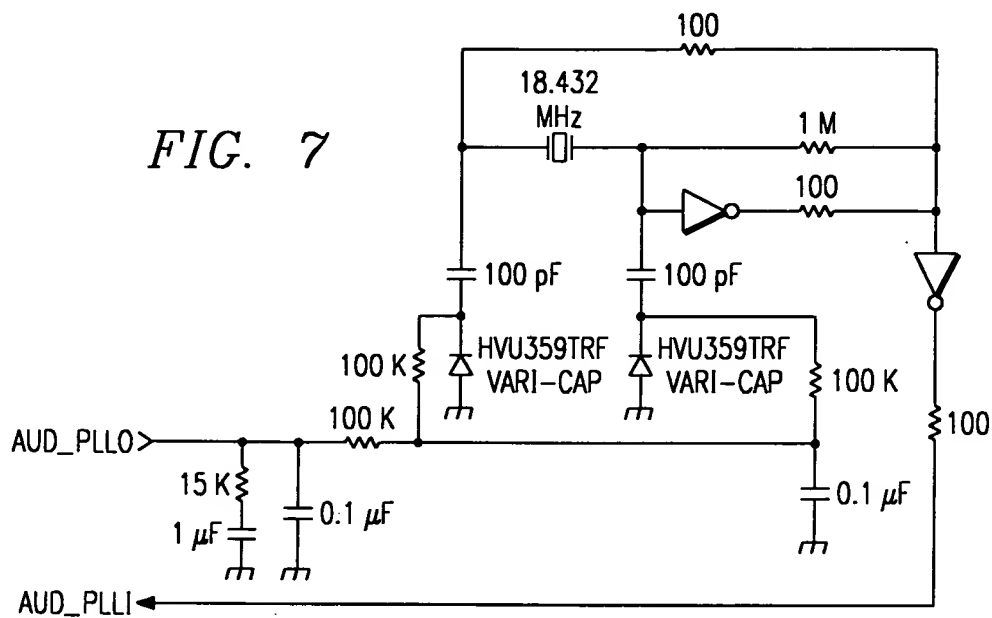


FIG. 8

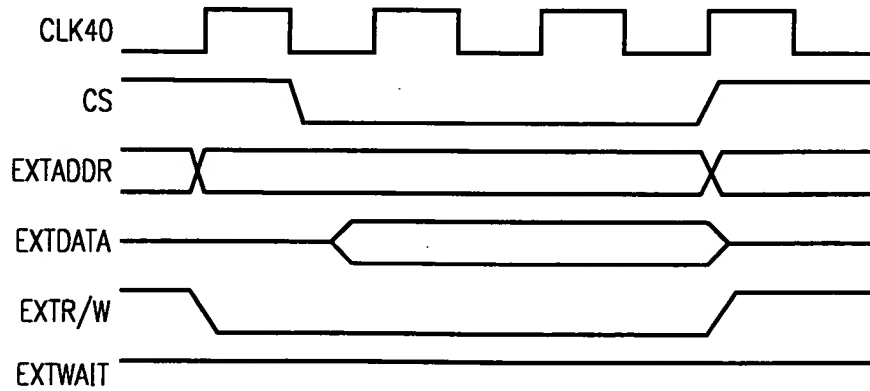


FIG. 9

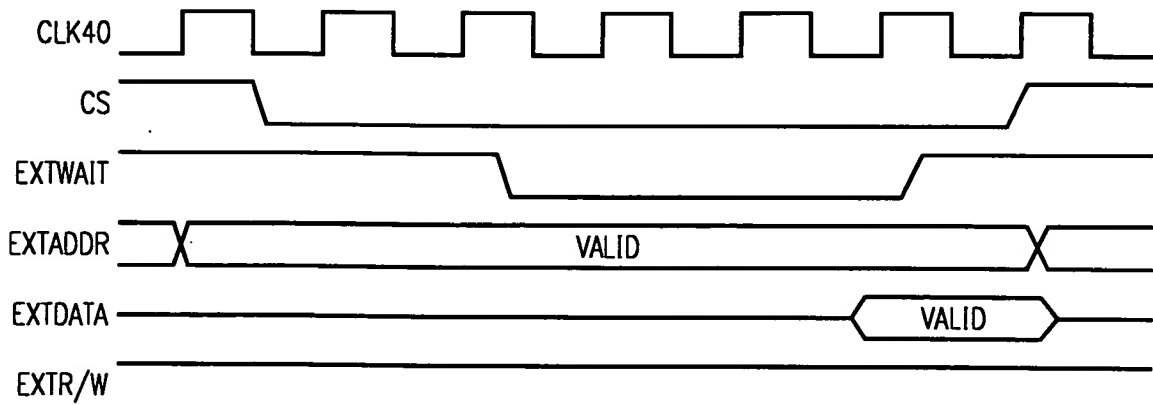


FIG. 10

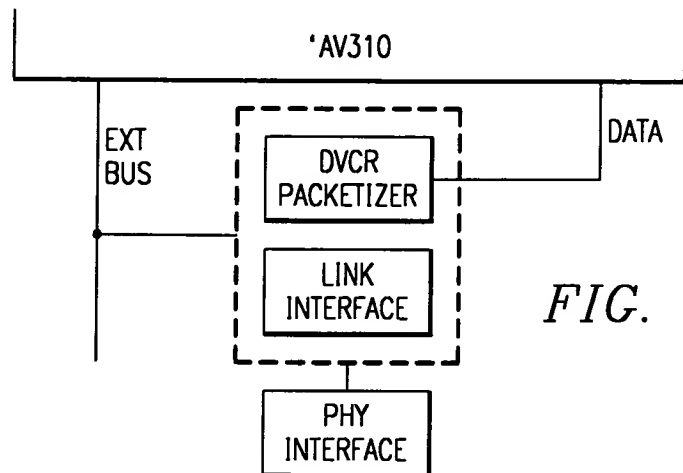


FIG. 11

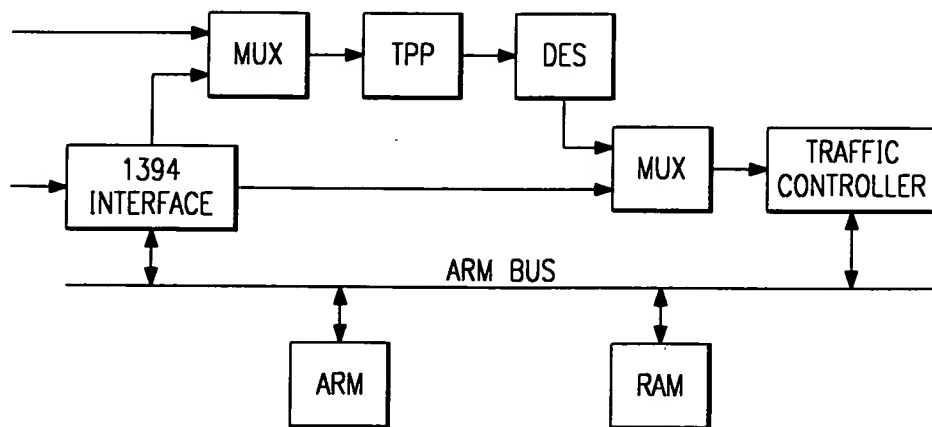


FIG. 12

FIG. 13

FIG. 14

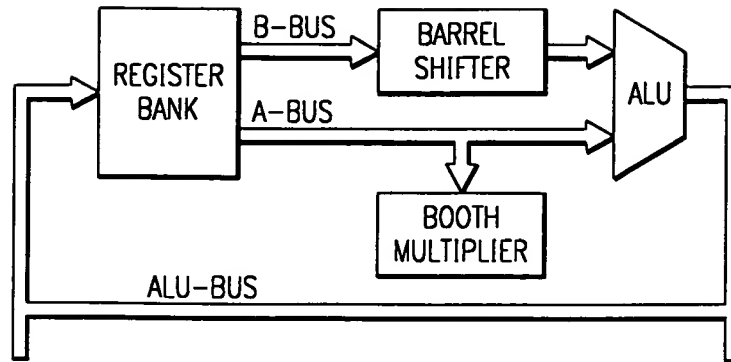


FIG. 15

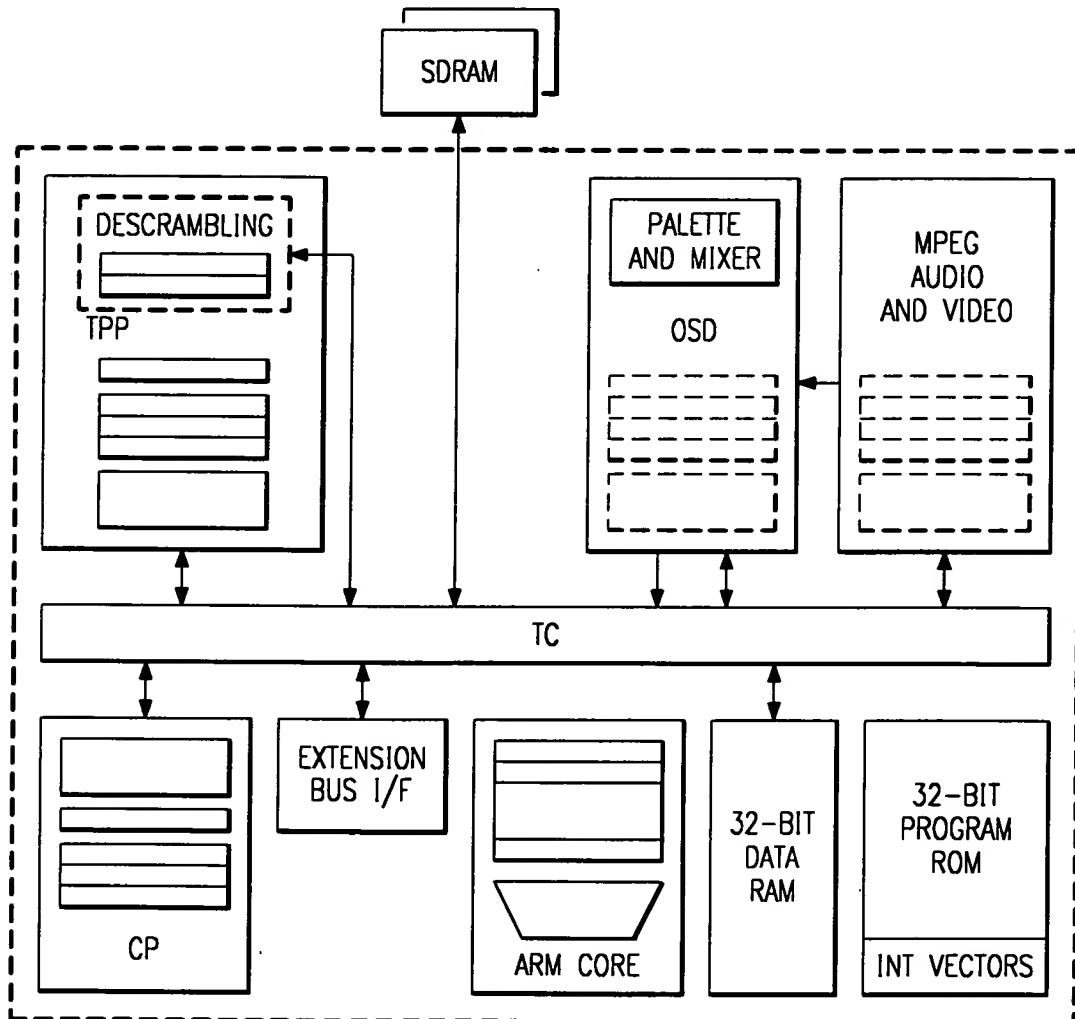
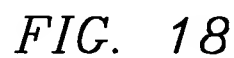
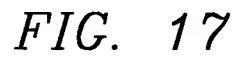


FIG. 16



CH1 NTSC/PAL ENCODER OUTPUTS		VIDEO ONLY	FULL OSD PICTURE	NON-OVERLAPPED OSD	BOTTOM OF OVERLAPPED OSD
CH2 DIGITAL VIDEO OUTPUT					
VIDEO ONLY		YES	YES	YES	YES
FULL OSD PICTURE		YES	YES	YES	NO
NON-OVERLAPPED OSD		YES	YES	YES	NO
TOP OF OVERLAPPED OSD		YES	YES	YES	NO

FIG. 19

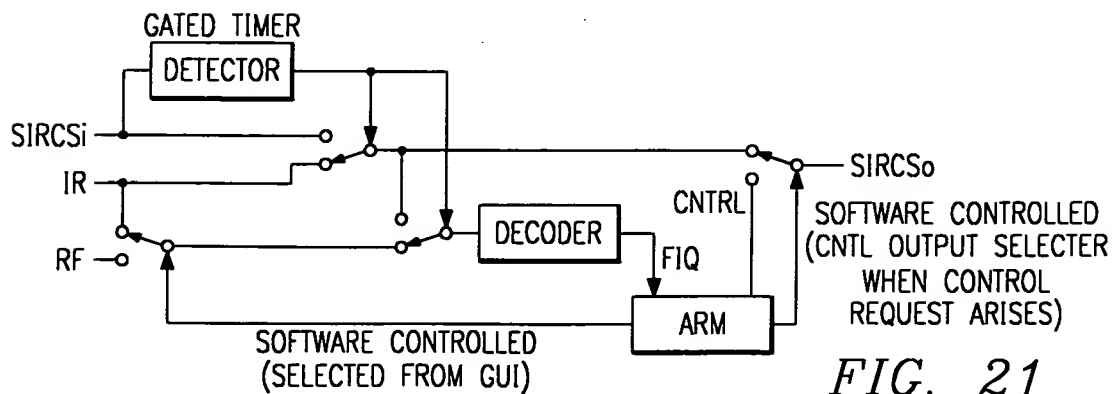
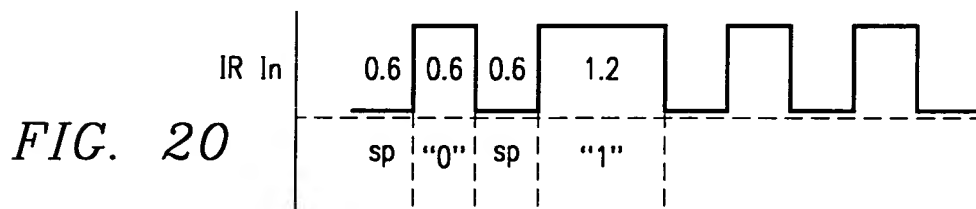
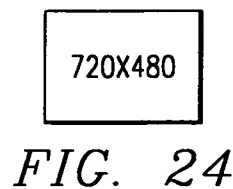
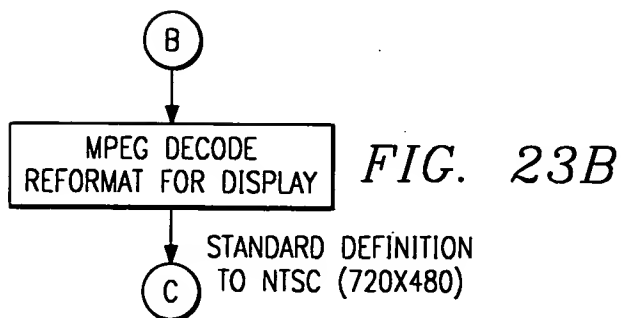
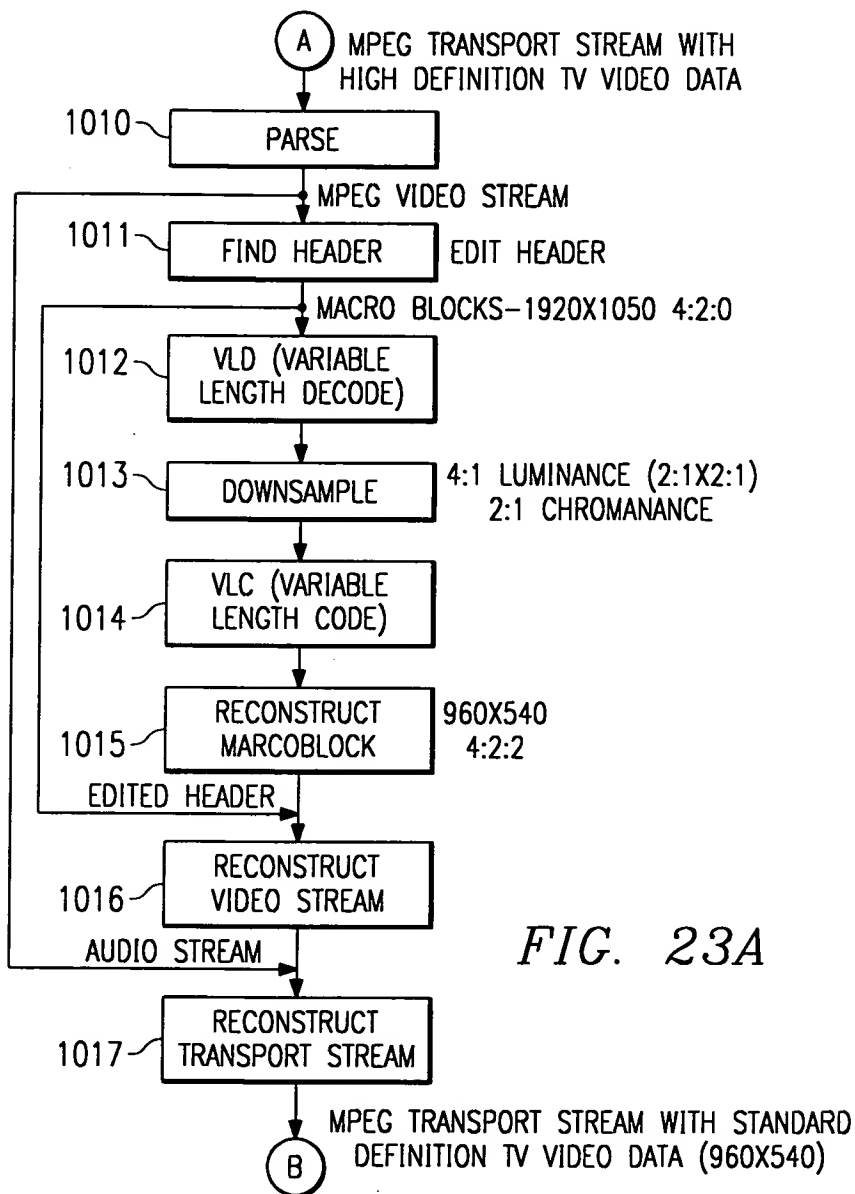
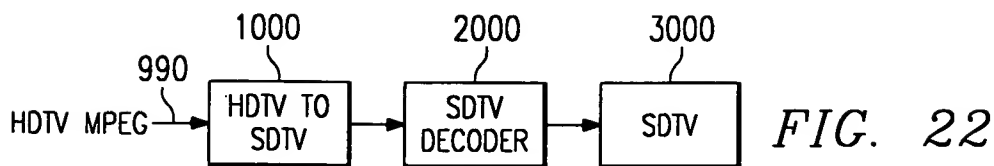


FIG. 21



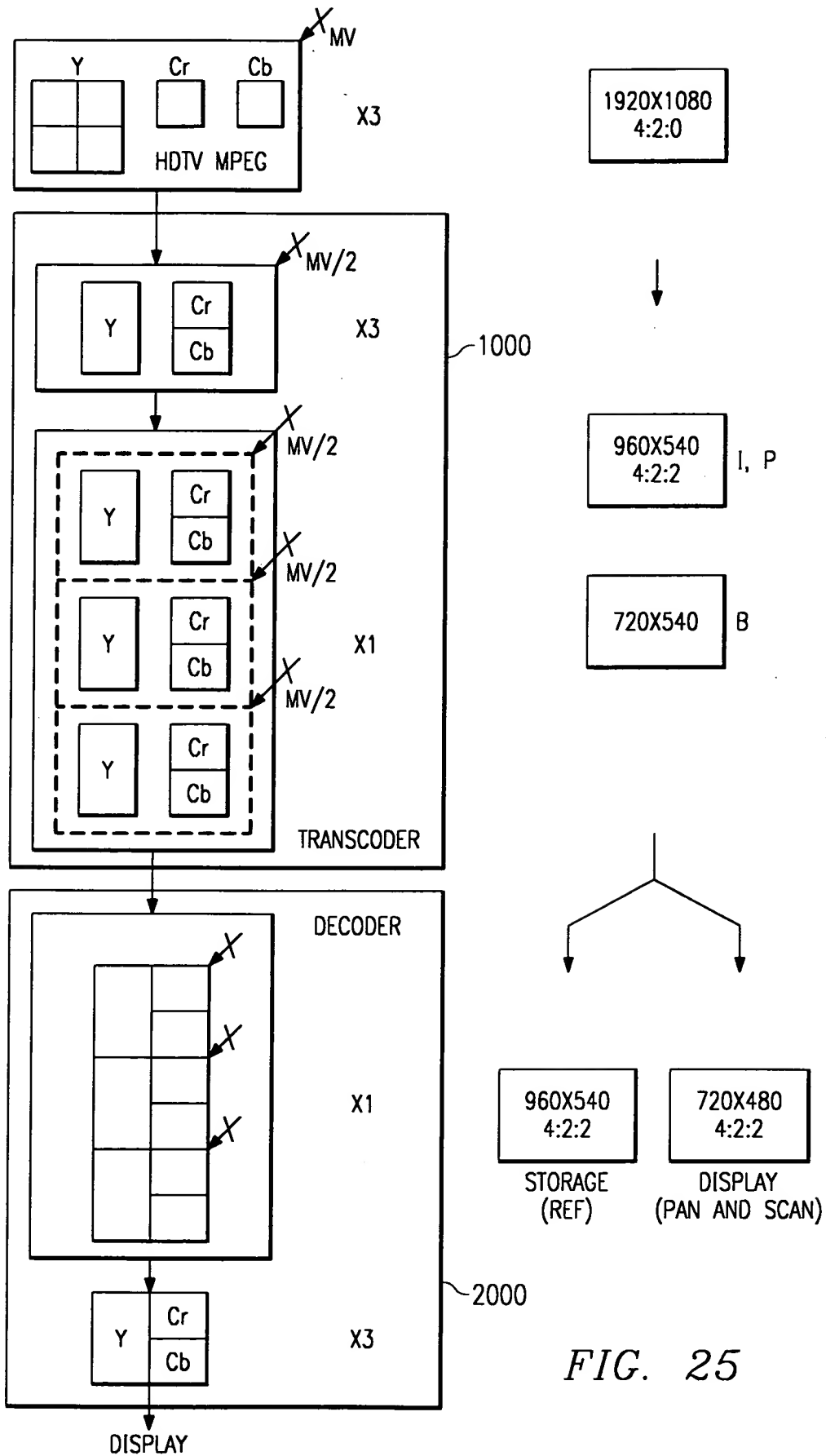


FIG. 25

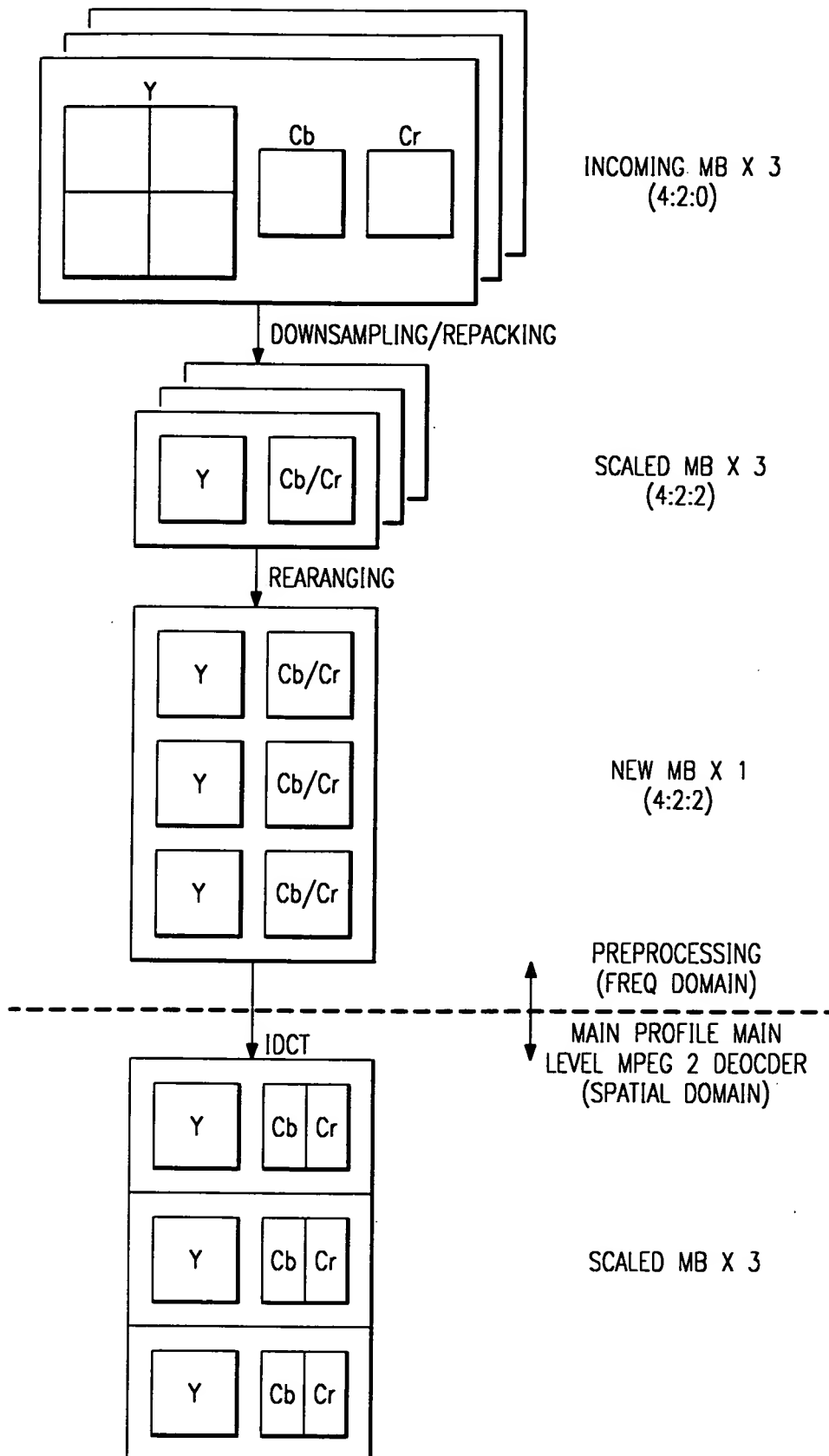


FIG. 26

1050

a_{ij}	b_{ij}	c_{ij}
	d_{ij}	e_{ij}

16X16 BLOCK
SPATIAL DOMAIN

↓ 16X16 IDCT

1051

A_{ij}	B_{ij}	C_{ij}
	D_{ij}	E_{ij}

16X16 BLOCK
FREQUENCY DOMAIN

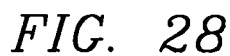
↓ FILTERING (KEEP UPPER-LEFT 8X8)

1052

A_{ij}

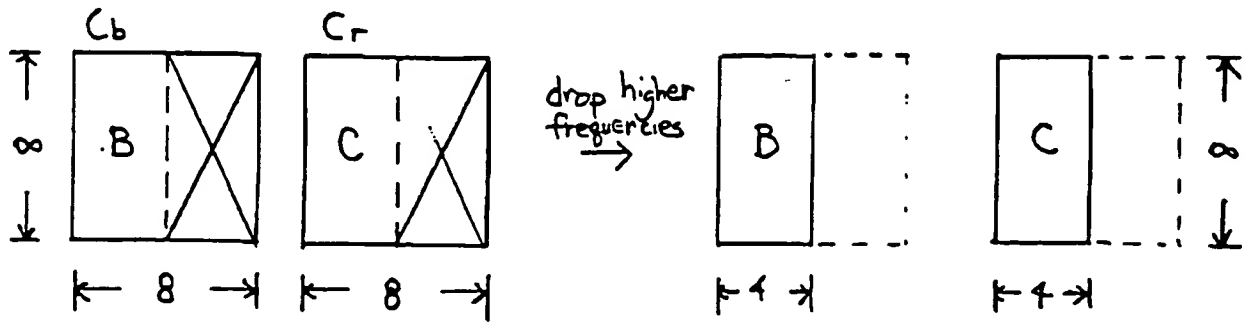
8X8 BLOCK FREQUENCY DOMAIN
 $A_{ij} = f(B_{ij}, C_{ij}, D_{ij}, E_{ij}) \quad i, j = 0, 1, \dots, 7$

FIG. 28



⑤ Chrominance Down Sampling & Repacking

Δ Downsampling (filtering):



Δ Repacking =

Purpose of repacking is to prepare data in such a way that a 8×8 IDCT would recover b & c directly.

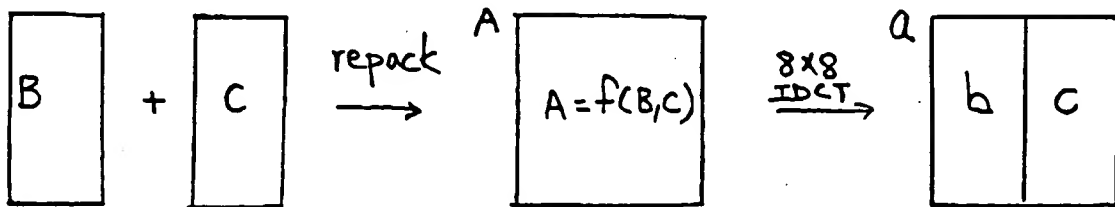


Fig. 27b

FUNCTIONAL BLOCK DIAGRAM OF THE TRANSCODER CHIP

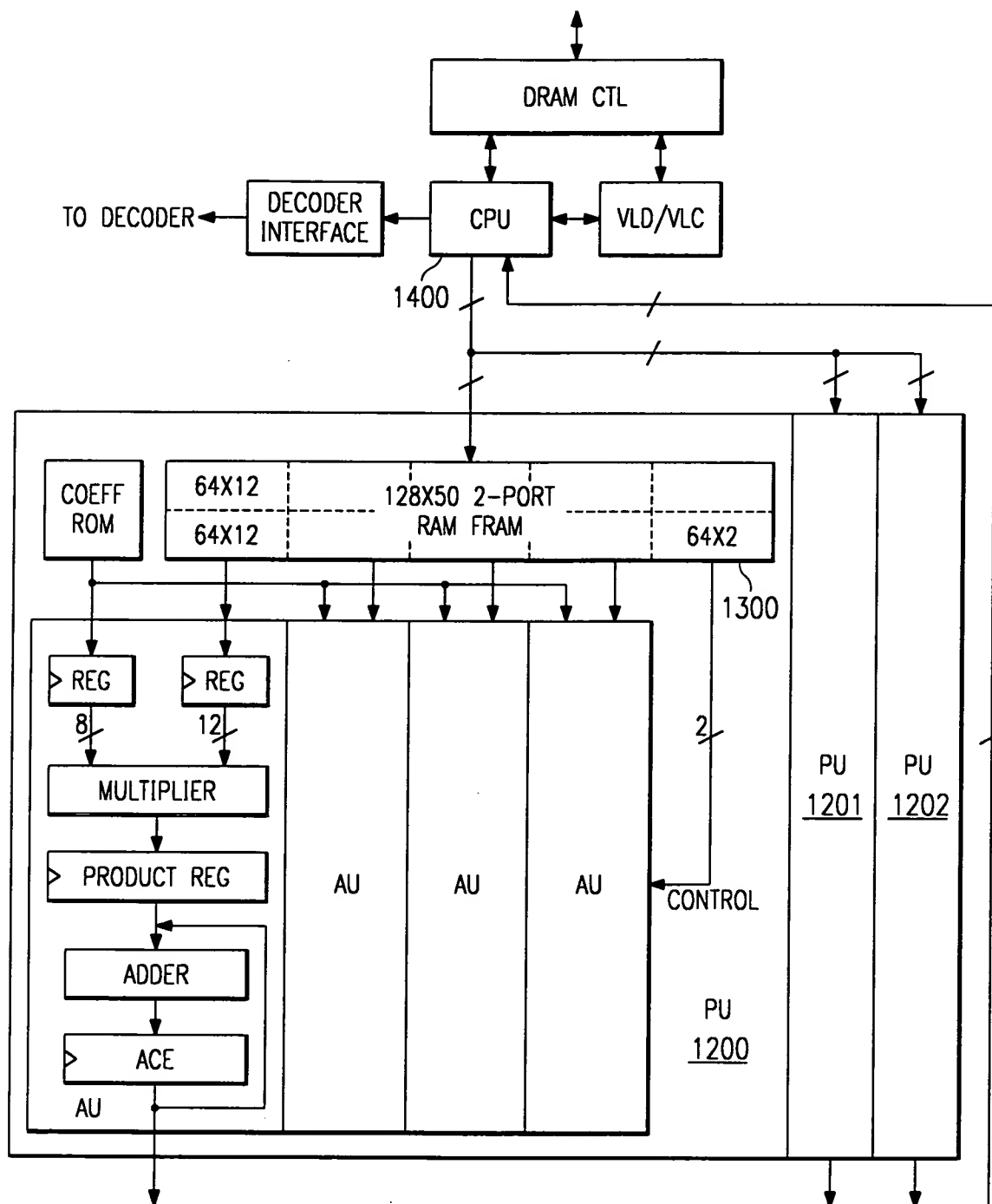


FIG. 29

```

graph TD
    Start([For J=0; J < number of MBs; J++]) --> Decision{MB(J)  
needs to be fixed?}
    Decision -- Yes --> FullRes[Full resolution decode MB(J)  
-- motion comp image  
-- inverse DCT on residual DCT  
-- add residual to motion comp image]
    Decision -- No --> MVStar[ $MV^*(J) = MV(J)/2$ ]
    MVStar --> ResidualDCT[ $residual\ DCT^*(J) =$   
DCT domain downsampled  
of residual DCT(J)]
    FullRes --> Spatial[Spatial domain  
downsample]
    Spatial --> Intra[Convert to intra MB]
    Intra --> OutputFixed[Output fixed MB]
    FullRes --> StoreFull[Store as full  
resolution MB]
    StoreFull --> Memory
    ResidualDCT --> ReducedRes[Reduced resolution decode  
--motion comp with  $MV^*(J)$   
--inverse DCT on  $DCT^*(J)$   
--add residual to motion comp image]
    ReducedRes --> StoreReduced[Store as reduced  
resolution MB]
    StoreReduced --> Memory
    Memory --> OutputFixed
    Memory --> OutputNotFixed[Output not fixed MB]
    OutputNotFixed --> MPEG[MPEG  
BITSTREAM]
    OutputFixed --> MPEG
    MPEG --> End([ ])

```

Fig. 30a

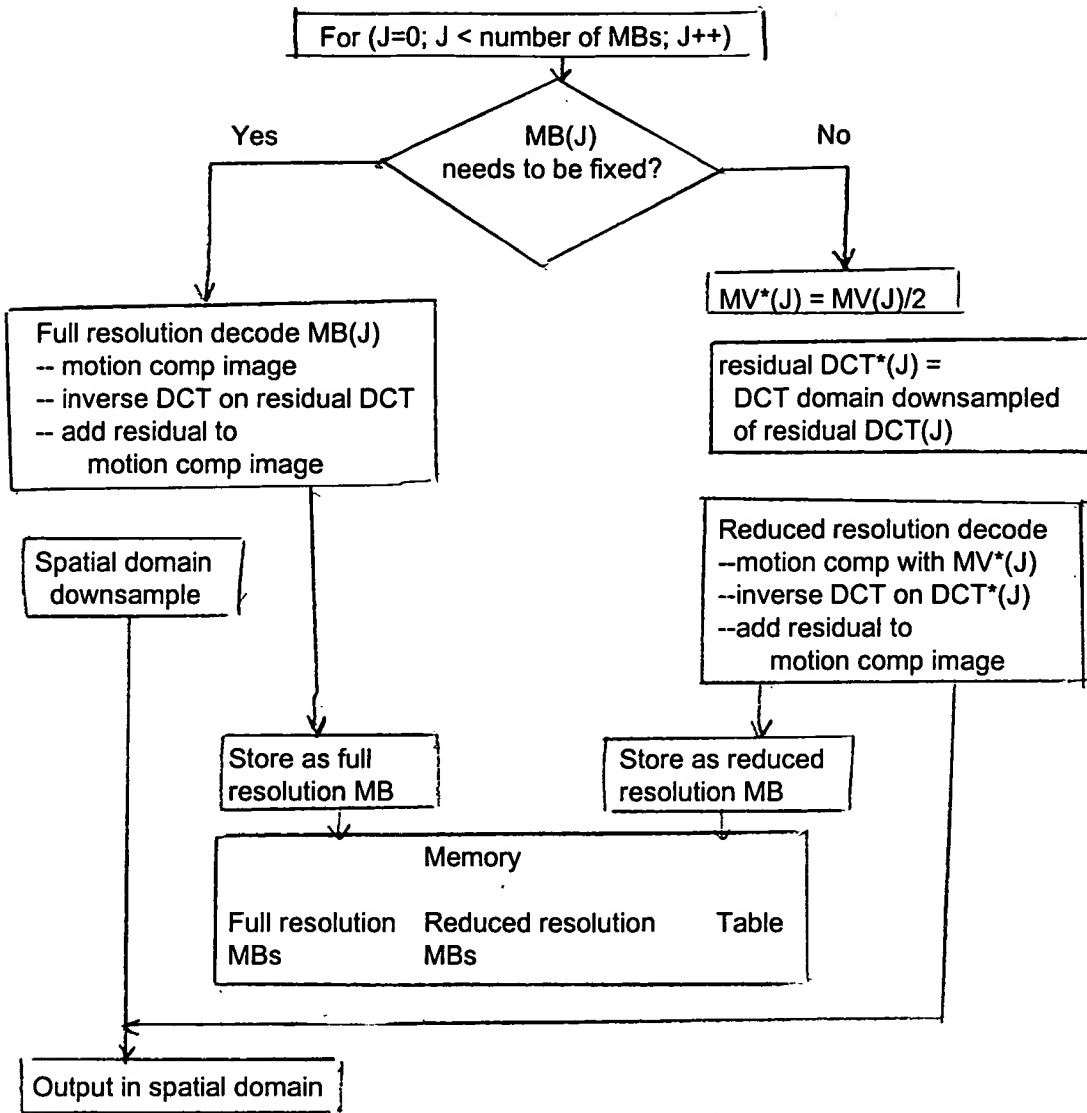


Fig. 30b

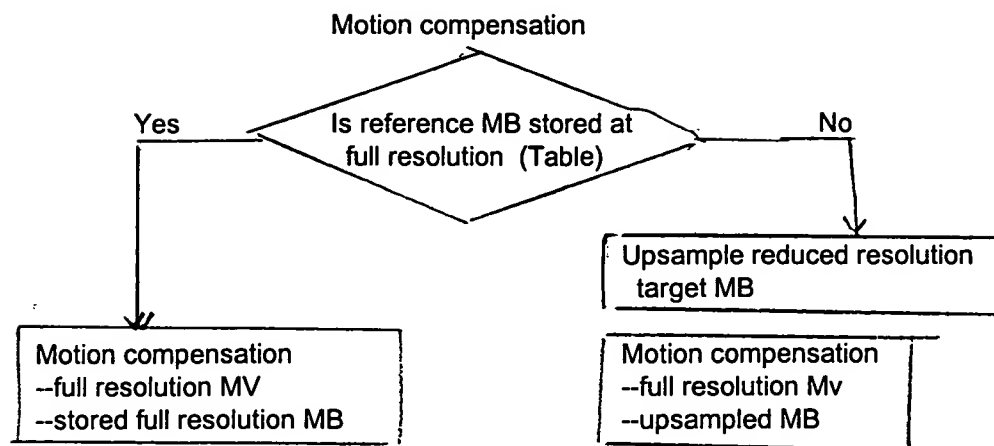


Fig. 30c

Generic Data Flow of Transcoder

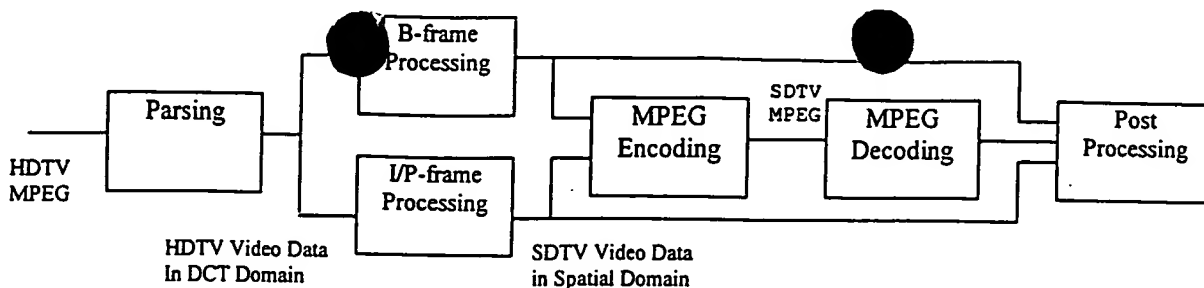


Fig 32a

Transcoder Option 1: utilizing existing SDTV MPEG decoder

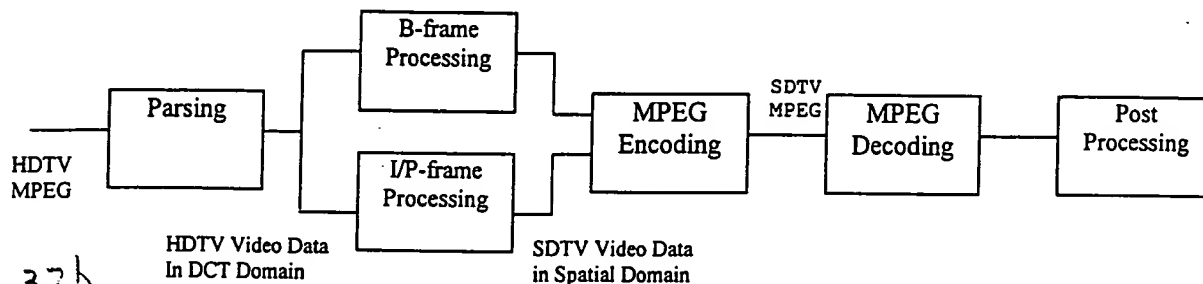


Fig. 32b

Transcoder Option 2: direct decoding

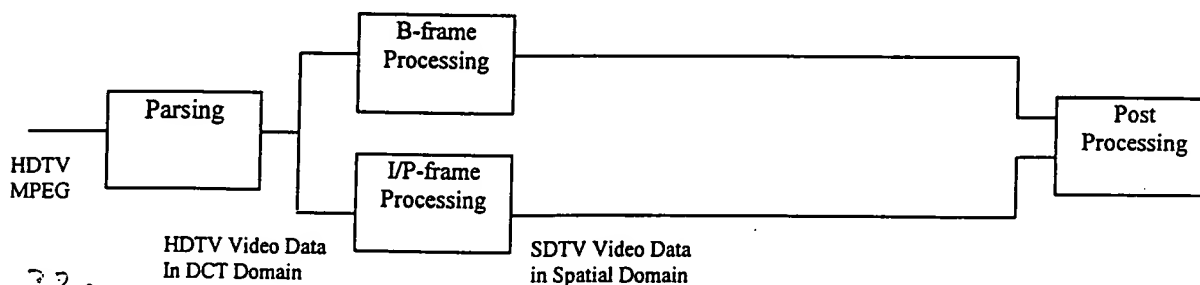


Fig. 32c

Transcoder Option 3: combination of options 1 and 2

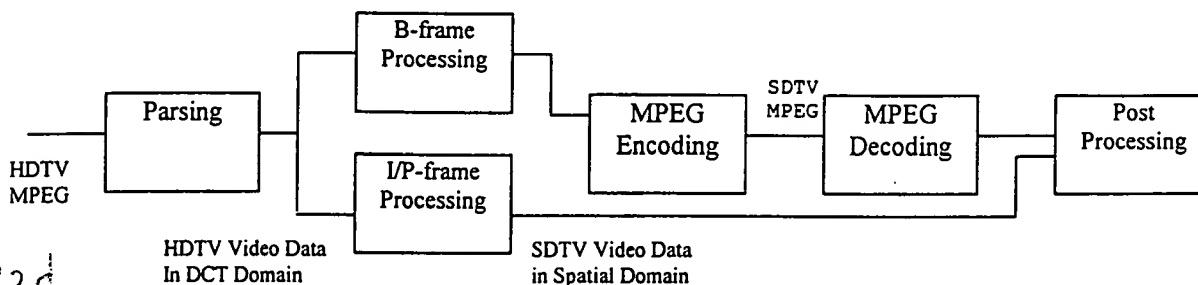


Fig. 32d

B-Frame Processing

Perform downsampling operation as described in Part I, HDTV downsampling Operation, followed by motion compensation.

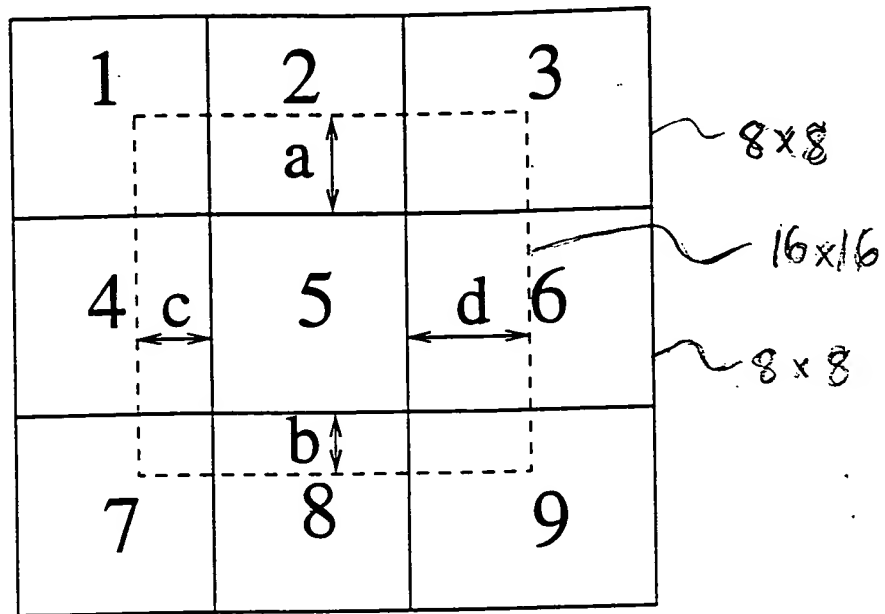


Fig. 33